UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

OCT 0 2 2019

Mr. Andrew S. Hartten
Principal Remediation Project Manager
The Chemours Group
1007 Market St
P.O. Box 2047
Wilmington, DE 19899

Re: Delaware River Screening-Level Ecological Risk Assessment
Chemours Chambers Works
Route 130
Deepwater, Salem County, New Jersey
NJDEP SRP PI# 008221
EPA J.D. Number: NJD 002385730

Dear Mr. Hartten:

The U.S. Environmental Protection Agency (EPA) Region 2 and the New Jersey Department of Environmental Protection (NJDEP) have prepared comments regarding the Delaware River Screening Level Ecological Risk Assessment (SLERA) Report dated December 2018, submitted pursuant to the Resource Conservation and Recovery Act (RCRA) Hazardous and Solid Waste Amendments (HSWA) Permit and the Technical Requirements for Site Remediation at N.J.A.C. 7:26E (Tech Regs). Please find EPA and NJDEP comments below.

EPA Comments

1. EPA recommends using the PFAS Ecological Screening Values (To Be Considered Values) sent by Gina Ferreira via email on September 17, 2019.

2. The report states that, "demersal fish may also be exposed to COPECs through the direct ingestion of sediment-associated prey and the incidental ingestion of sediment and pore water while foraging in sediment." However, these exposure pathways were considered secondary and not quantified. Demersal fish exposure should be evaluated and quantified in this SLERA using conservative food-chain models since sediments within the Delaware River adjacent to the site contain site-related COPECs.

3. Section 7 of the report describes the Refined Ecological Exposure Evaluation Approach performed after the SLERA was prepared. USEPA agrees with the use of more representative exposure assumptions in the refined evaluation but does not agree with the development and application of ecological benchmarks that include site-specific inputs. The NJDEP Ecological Evaluation Technical Guidance allows for the use of alternative TRVs "based on site-specific circumstances provided that adequate justification is provided." This justification should be presented in the SLERA work plan or technical memorandum for adequate review and research.

4. HQs greater than one indicate that potential ecological risks may be occurring to ecological receptors of concern. There should be no qualifiers on HQs greater than one or emphasis on HQs greater than or less than 10.

5. Page 3, Section 1.1 – The third specific objective of the SLERA for each exposure area should be replaced by an objective that includes the use of conservative exposure assumptions and values to calculate screening-level ecological risks. Refining COPECs takes place after the SLERA risks are calculated and show the potential for adverse effects to ecological receptors.

6. Page 5, Section 2.1, 1st sentence – Add in the word "acre" after 1455.

7. Page 30, Section 4.7 - Pore water is one item in a weight of evidence approach and is not "afforded greater weight in estimating exposure and characterizing risk to benthic invertebrate communities." As stated to Chemours previously, more effective methods to evaluate exposure are toxicity testing, tissue sampling, and bioaccumulation studies.

8. Page 35, last paragraph – Conservative exposure factors are used in SLERAs to calculate potential ecological risks. Average or typical exposure factors are used in the Baseline Ecological Risk Assessment to calculate risks.

9. Page 48, Section 7.2.3 – This section states that surficial sediment samples from the depth 0 to 2 centimeters from the DIVER database were used to estimate representative background concentrations. This depth which equals less than 1 inch (0.79) is not representative of the site sediment found at depths of 0 – 6 inches and 6 inches to 1 foot.

NJDEP Comments

1. **Executive Summary, page xi, Manufacturing Zone and page xii, Carneys Point Zone:** The Report states that sediments that "adversely affect benthic communities" are "spatially-limited." Considering that benthos do not have a large range of movement, even "spatially-limited" areas must be addressed.

2. The Report emphasizes the use of equilibrium partitioning (EqP). In accordance with NJDEP 2018, Section 6.2.2.3, EqP is only one line of evidence and collection of pore water samples is preferred.

3. The SLERA minimizes any HQ less than 10. This is counter to all guidance, both USEPA and NJDEP. Any HQ above 1 must be carried through to the baseline ecological risk assessment (BERA).

4. **1.0 Introduction, page 2:** The SLERA states that samples from the Salem canal and Delaware River "were analyzed for perfluorinated compounds …[; however,]… [t]hese results are not included in the ecological exposure evaluations presented in the SLERA due to the lack of

reliable ecotoxicity data for these constituents." NJDEP/ETRA encourages the use of the Michigan "Aquatic Maximum Values" of 7,700 µg/L for PFOA (CAS # 335671) and 780 µg/L for PFOS (CAS # 1763231) (https://www.michigan.gov/documents/deq/wrd-swas-rule57_372470_7.pdf).

5. **1.1 Scope and Objectives, page 3:** The third bullet in this section states "refine the list of COPECs using exposure assumptions that are more representative of site-specific exposure conditions." This step is associated with the BERA and should not be part of the SLERA.

6. **4.5.1 Bioaccumulation, page 26:** The first paragraph on this page list sources for chemical properties. Where available, the USEPA Regional Screening Tables should be used for chemical properties (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

7. **4.5.2 Ecotoxicity, Volatile and Semi-Volatile Organic Constituents, pp 27-28:** The SLERA references "acute toxicity data for chlorobenzene." Chronic ecotoxicity values must be used in the SLERA.

The SLERA references EPA guidance for PAH evaluation. The tiered approach as outlined in NJDEP 2018, Section 6.4.6 should be used.

8. **4.6.1 Benthic Invertebrates, page 29:** The SLERA relies almost exclusively on the equilibrium partitioning (EqP) to make toxicity determinations. In accordance with NJDEP 2018, Section 6.2.2.3, EqP is only one line of evidence, and the collection and analysis of pore water samples is preferred. Therefore, this section of the SLERA should be rewritten to deemphasize EqP.

9. **4.7 Assessment and Measurement Endpoints, page 30:** The SLERA states that "the measurement endpoint based on estimated exposure to pore water using an EqP approach is afforded greater weight in estimating exposure and characterizing risk to benthic invertebrate communities." See **4.6.1 Benthic Invertebrates**, above.

10. **4.8.1 Sediment, page 31:** The SLERA references "calculated ESVs based on an EqP model (DuPont CRG, 1999)." These values and their derivation should be provided for review.

11. **5.1.1 Bulk Sediment, page 32:** The SLERA states that the biotic zone "extends from the SWI to a maximum depth of 0.5 feet below the SWI." In accordance with NJDEP 2018, Section 4.0, the biotic zone for sediment is generally 0"-6"; however, may extend deeper based on the presence of burrowing receptors.

12. **5.1.2 Surface Water, page 33:** The SLERA states that "surface water samples were collected at approximately 1 foot above the SWI or at mid-water interval for stations with a total water depth less than 3 feet." In accordance with NJDEP 2018, Section 5.3.3.2, "when COPECs are potentially present because of sediment contamination or groundwater migration pathway, samples should be collected from the zero to six-inch interval directly above the sediments."

13. **5.2.2 Wildlife Ingestion Pathway Evaluation, pages 34-36:** The SLERA states that the "models estimated EDDs within each of the four exposure areas … and summed the spatially

weighted EDDs … to evaluate aggregate exposure along the entire Chambers Works shoreline." No "clean zone" samples should be included in the evaluation for the SLERA. Either each contaminant area should be evaluated separately, or only the values with each contaminated area should be summed.

The SLERA states that "for constituents with EDDs exceeding first-tier TRVs in the screening-level exposure evaluation, alternative TRVs were considered in the refined exposure evaluation (Section 7.3.3)." The NOAEL and LOAEL form the TRVs selected from the tier 1 group are to be used to bound the risk throughout the ecological risk assessment process. The reason for including tier 2 and tier 3 TRVs in NJDEP 2018 is so that if a site has contaminants that are not included in the tier 1 TRVs, then TRVs from tier 2 can be selected. Likewise, if the site has contaminants that neither tier 1 nor tier 2 TRVs are available, then TRVs can be selected from the tier 3 group (literature search). Adequate justification must be provided to vary from these TRVs. Therefore, the tier 1 TRVs should be carried throughout the risk assessment. In the BERA, the numerator of the risk calculation may be modified using of area use factors and seasonal use factors; however, the TRVs remain the same.

14. **6.2.1 Jackson Labs/TEL Area, Benthic Invertebrates, pages 338-39:** The SLERA uses the term "preliminary ESVs." There are no preliminary ESVs. Ecological screening criteria (ESCs) or ecological screening values (ESVs) are used to determine which contaminants will be carried through for further evaluation. At that point, the risk assessment process begins.

The SLERA uses ranges of HQs and dismisses any HQs less than 10. This is unacceptable. All contaminants with an HQ greater than 1 must be carried through to the risk assessment process. The SLERA dismisses acetone as a laboratory contaminant without providing any evidence. This is unacceptable. DuPont must provide data from trip blanks, method blanks, etc. with elevated acetone levels in order to make the claim that it is a laboratory contaminant.

15. **Fish, page 39:** See comment above regarding HQs above 1.

The SLERA ignored the sediment and food pathways for fish exposure. This is unacceptable and the risk assessment must include these pathways.

15. **6.2.2 – 6.2.5, pages 40-45:** The comments from **6.2.1**, above, apply to these sections.

16. **6.3.1 Benthic Invertebrates, page 45:** The SLERA uses "site-specific ESVs." See comments in **6.2.1**, above.

17. **6.3.2 Fish, page 45:** The food chain and sediment pathways must be evaluated for fish.

The SLERA states that "the estimate bioaccumulation of other persistent bioaccumulative constituents, including pesticides and PCBs, into benthic invertebrates and fish did not result in doses that are expected to cause adverse effects;" however, these levels were not measured in the field and no bioaccumulation tests were conducted with the sediment in a laboratory.

The SLERA states that "incidental ingestion of sediment … was not quantitatively evaluated in the SLERA." This pathway must be evaluated and generally a value of 5%-10% of the food ingestion rate is used, dependent on the foraging methods employed by the receptor being evaluated.

The SLERA concludes "no further evaluation." This is unacceptable. All comments must be addressed.

18. **6.3.3 Semi-Aquatic Wildlife, page 46:** Tissue measurement will reduce the uncertainty in this section.

19. See previous comments regarding TRVs.

20. **7.0 Refined Ecological Exposure Evaluation Approach, page 47:** The SLERA uses "frequency and magnitude of detection" to eliminate COPECs. Hot spots must be considered before frequency and magnitude of detection may be considered.

21. **7.2.1 Exposure Point Concentrations, pages 47-48:** The SLERA uses statistics to eliminate COPECs. In the calculations of the UCL, clean zone samples should not be included in the calculations and hot spots must be considered.

22. **7.2.3 Comparison to Background Threshold Values, page 48:** The SLERA uses regional data for background. USEPA questioned the appropriateness of the data used. In addition, The following must be considered when using regional data: 1) data associated with other potential sources must be excluded in accordance with the "background contamination" definition in Section 4.0 of NJDEP 2018; 2) outliers within the dataset must be removed in accordance with Section 5.4.3 of NJDEP 2018; 3) UTL, UPT or UCL values cannot exceed the maximum value in the dataset; and, 4) like statistics from the site and regional or background datasets must be compared in accordance with Section 5.4.3 of NJDEP 2018. The data should be supplied for separate analysis.

23. **7.2.4 Refined Bulk Sediment Quality Benchmarks, pages 49-50:** See previous comments on EqP. The SLERA states that the "ΣESBTU values less than 1 are considered to be protective of benthic invertebrate communities." Toxicity tests are preferred.

24. **PAHs, page 52:** The SLERA states that chemical properties were obtained from EPA, 2012a and EPA 2003a. Chemical property data should be obtained from the RSL (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables) for the most up to date chemical properties, where available.

25. **7.3.3 Toxicity Reference Values, pages 53-54:** See previous comments regarding TRVs.

26. **8.1.2 Semi-Aquatic Wildlife, pages 59-60:** See previous comments regarding TRVs. The most conservative TRVs should be used to be protective of the most sensitive receptors; the exposure factors may be adjusted.

27. **8.2.1 Benthic Invertebrates, page 60:** The SLERA states that the contaminated areas consist of "spatially limited areas." Considering that benthos have a very limited home range, even spatially limited areas can have an effect on them.

28. **8.2.2 Semi-Aquatic Wildlife, page 61:** The SLERA states that "negligible site-related risk to semi-aquatic wildlife" is indicated. All previous comments must be addressed.

29. **8.3 Scientific Management Decision Point, pages 61-62:** The SLERA reiterates that "negligible site-related risk to semi-aquatic wildlife" is indicated. All previous comments must be addressed.

The SLERA indicates negligible risk to fish; however, sediment and food chain exposure were ignored. See previous comments.

The SLERA indicates that a more thorough evaluation of benthos needs to be conducted. NJDEP agrees; however, all previous comments must be addressed, and the further evaluation must be conducted in accordance with regulations and guidance.

30. **9.1.1 Screening and Sediment Quality Benchmarks, page 63:** All previous comments must be addressed.

31. **9.1.2 Constituent Bioavailability, page 64:** The SLERA indicates that differences in absorption could over or under estimate bioavailability. Tissue sampling or laboratory bioaccumulation tests can eliminate this uncertainty.

32. **10.0 Conclusions and Recommendations – 10.2.2 Recommendations, pages 66-69:** All previous comments must be addressed.

Upon your receipt and review of the comments, we recommend a conference call or meeting with USEPA, NJDEP and Chemours to address all outstanding risk assessment issues before the SLERA can be finalized. Please submit a written response addressing the enclosed comments no later than sixty (60) days from the date of your receipt of this letter.

To set up a meeting or if you have any questions, please contact Eleni Kavvadias, of my staff, at (212) 637-4138, or via email at kavvadias.eleni@epa.gov.

Sincerely,

Ben Conetta, Chief
Corrective Action Section
Land and Redevelopment Programs Branch